

10 Rec'd PG

16 DEC 2005

10/523006

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	)	Art Unit:
Henrik PEDERSEN	)	
	)	Examiner:
	)	
Serial No.: 10/523,006	)	Washington, D.C.
	)	
Filed: July 30, 2005	)	December 16, 2005
	)	
For: MULTI-STEP SYNTHESIS OF	)	Docket No.: PEDERSEN12
TEMPLATED MOLECULES	)	

INFORMATION DISCLOSURE STATEMENT [IDS]

Honorable Commissioner of Patents  
and Trademarks  
Washington, D.C. 20231

S i r :

This Information Disclosure Statement is submitted in accordance with 37 C.F.R. 1.97, 1.98, and it is requested that the information set forth in this statement and in the listed documents be considered during the pendency of the above-identified application, and any other application relying on the filing date of the above-identified application or cross-referencing it as a related application.

1. This IDS should be considered, in accordance with 37 C.F.R. 1.97, as it is filed:

[X] A. within three months of the filing date of the above-identified national application or within three months of the entry into the national stage of the above-identified international application. See 37 CFR 1.97(b).

[X] B. before the mailing date of a first office action on the merits. See 37 CFR 1.97(b).

[ ] C. after (A) and (B) above, but before final rejection or allowance, and Applicants have made the necessary certification (box "i" below) or paid the necessary fee (box "ii"

below). See 37 CFR 1.97(c).

[ ] i. Counsel certifies that, upon information and belief, each item of information listed herein was either (a) cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this IDS or (b) was not cited in a communication from a foreign patent office in a counterpart foreign application and was not known to any individual designated in 1.56(c) more than three months prior to the filing of this IDS.

[ ] ii. A check for the fee set forth in 1.17(p), presently believed to be \$180, is enclosed (check no. \_\_\_\_\_).

[ ] D. after (A), (B) and (C) above, but before payment of the issue fee. Applicant petitions under 37 C.F.R. 1.97(d) for consideration of this IDS. A check for the fee set forth in 1.17(i)(1), presently believed to be \$130 is enclosed (check no. \_\_\_\_\_). Counsel certifies that, upon information and belief, each item of information listed herein was either (i) cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this IDS or (ii) was not cited in a communication from a foreign patent office in a counterpart foreign application and was not known to any individual designated in 1.56(c) more than three months prior to the filing of this IDS.

[ ] E. As a submission in accordance with the transitional procedure for limited examination after final rejection pursuant to 37 CFR \$1.129(a). Pursuant to MPEP \$706.07(g), page 700-46, col. 2 (February 2000), this IDS is treated as if filed with a period set forth in 37 CFR \$1.97(b)

and considered without the petition and petition fee required by 1.97(d).

2. In accordance with 37 C.F.R. 1.98, this IDS includes a list (e.g., form PTO-1449) of all patents, publications, or other information submitted for consideration by the office, either incorporated into this IDS or as an attachment hereto. A copy of each document is attached, except as explained below.

[X] While an IDS filed under \$1.97 must contain a "list of all patents, publications or other information submitted for consideration by the Office", see \$1.98(a) (1), the only requirement for the list is that it provide the information set forth in \$1.98(b). There is no requirement that a form PTO-1449 be used (MPEP \$609 merely says that use of this form is "encouraged"). Counsel has used a list provided to him by Applicants, and not transferred the information to a PTO-1449, to avoid the risk of any inadvertent error in transferring the information.

[ ] A. Documents \_\_\_\_\_ are deemed substantially cumulative to documents \_\_\_\_\_, and, in accordance with 1.98(c), only a copy of each of the latter documents is enclosed.

[ ] B. Certain documents were previously cited by or submitted to the Office in the following prior application(s), which are relied upon under 35 U.S.C. 120:

[insert serial number/filing date]

Applicants identify these documents by attaching hereto copies of the form PTO-892s and PTO-1449s from the files of the prior applications or a fresh PTO-1449 listing these documents, and request that they be considered and made of record in accordance

with 1.98(d). Per 37 CFR 1.98(d), copies of these documents need not be filed in this application. If copies of any of these documents cannot be found in the files of the prior applications, the Examiner is requested to so notify counsel before taking action in this case, so replacement copies can be submitted. While an IDS filed under §1.97 must contain a "list of all patents, publications or other information submitted for consideration by the Office", see §1.98(a) (1), the only requirement for the list is that it provide the information set forth in §1.98(b). There is no requirement that a form PTO-1449 be used (MPEP §609 merely says that use of this form is "encouraged") and no prohibition on submitting a copy of a form PTO-1449 or form PTO-892 from a prior case. Indeed, the re-use of such forms is desirable as it avoids error in transferring the information, and evidences that the reference was considered in a prior application. A previously accepted PTO-1449, or an examiner-prepared PTO-892, necessarily complies with §1.98(b).

[X] 3. Document EM is not in the English language. In accordance with 1.98(c), Applicants state:

[ ] documents \_\_\_\_\_ already contain an English language abstract, summary or claim set.

[X] a publicly available abstract is attached to each of documents EM, and the source of each abstract is indicated thereon.

[ ] documents \_\_\_\_\_ are patents or published patent applications for which counterpart English language patents or patent applications exist, and are enclosed, as follows:

<u>Foreign Lang. Doc.#</u>	<u>English Lang. Doc.#</u>
[insert]	[insert]

[ ] applicants have prepared an English translation of

at least the pertinent portions of documents \_\_\_\_\_, and copies are attached.

[ ] A concise explanation of the relevance of documents \_\_\_\_\_ is found in the attached search report from the \_\_\_\_\_ Patent Office (see reply to Comment 68 in the preamble to the final rules; 1135 OG 13 at 20).

[ ] A concise explanation of the relevance of documents \_\_\_\_\_ is set forth as follows:  
[Insert concise explanation of relevance]

4. No explanation of relevance is necessary for documents in the English language (see reply to Comments 67 and 68 in the preamble to the final rules; 1135 OG 13 at 20).

5. Other information being provided for the examiner's consideration follows:

[insert other information]

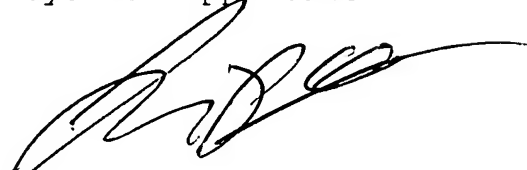
6. In accordance with 37 C.F.R. 1.97(g) and (h), the filing of this IDS should not be construed as a representation that a search has been made or that information cited is, or is considered to be, material to patentability as defined in §1.56 (b), or that any cited document listed or attached is (or constitutes) prior art. Unless otherwise indicated, the date of publication indicated for an item is taken from the face of the item and Applicant reserves the right to prove that the date of publication is in fact different.

7. The Commissioner is hereby authorized and requested to charge any additional fees which may be required in connection with this application or credit any overpayment to Deposit Account No. 02-4035.

Respectfully submitted,

BROWDY AND NEIMARK, P.L.L.C.  
Attorneys for Applicant

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FORM PTO-1449 U.S. DEPARTMENT OF COMMERCE  
PATENT AND TRADEMARK OFFICE

ATTY DOCKET NO: PEDERSEN = 12

SERIAL NO: 10/518,056

LIST OF DOCUMENTS CITED BY APPLICANT  
(Use several sheets if necessary)

APPLICANT: PEDERSEN, et al.

FILING DATE: 30- July 2003

GROUP:

U.S. PATENT DOCUMENTS (include at least patentee, patent number and issue date)

EXAMINER INITIAL		DOCUMENT NUMBER							DATE	PATENTEE	CLASS	SUB- CLASS	FILING DATE IF APPROP.
	AA	6	2	9	7	0	5	3	October 2, 2001	Stemmer			
	AB	2 0	0 5	0 0	2 5	7	6	6	February 2, 2005	Liu et al.			
	AC	2 0	0 5	0 0	4 2	6	5	9	February 24, 2005	Liu et al.			

FOREIGN PATENT DOCUMENTS (include at least document number, publication date and country)

		DOCUMENT NUMBER							DATE	COUNTRY	CLASS	SUB- CLASS	TRANSLATION YES/NO
	AD	9	6	0	5	3	1	6	March 28, 1996	PCT			
	AE	0	0	2	1	9	0	9	April 20, 2000	PCT			
	AF	20	04	0	0	9	8	14	January 29, 2004	PCT			
	AG	1	5	3	3	3	8	5	25 May, 2005	EP			

OTHER DOCUMENTS (include author, title, name of publication, volume, pages & date of publication)

	AH	Doyon, J.B et al. "Highly sensitive in vitro selections for DNA-linked synthetic small molecules with protein binding affinity and specificity" J. AM. CHEM. SOC, September 16, 2003.
	AI	Kanan, M.W et al. "Reaction discovery enabled by DNA-templated synthesis and in vitro selection" Nature, Vol. 431, 30 September 2004.
	AJ	"Finding reactions in a haystack: Try'em all, see what works" Meeting American Chemical Society, 10 September 2004, Vol. 305, Science.

EXAMINER

DATE CONSIDERED

EXAMINER: Initial if reference considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

FORM PTO-1449 U.S. DEPARTMENT OF COMMERCE  
PATENT AND TRADEMARK OFFICE

ATTY DOCKET NO: PEDERSEN12

SERIAL NO: 10/523,006

INFORMATION DISCLOSURE STATEMENT  
LIST OF DOCUMENTS CITED BY APPLICANT  
(Use several sheets if necessary)

APPLICANT: PEDERSEN, et al

IA FILING DATE: July 30, 2003

GROUP:

**U.S. PATENT DOCUMENTS (include at least patentee, patent number and issue date)**

EXAMINER INITIAL		DOCUMENT NUMBER	DATE	PATENTEE	CLASS	SUB- CLASS	FILING DATE IF APPROP.
	AK	20050042669	Published 24 February 2005	Liu, David R			
	AL	20050025766	Published 3 February 2005	Liu, David R			

**FOREIGN PATENT DOCUMENTS (include at least document number, publication date and country)**

		DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUB- CLASS	TRANSLATION YES/NO
	AN	2004099441	18 Nov 2004	PCT			
	AO	03082901	9 Oct 2003	PCT			
	AP	9105058	18 April 1991	PCT			
	AQ	2005026387	24 March 2005	PCT			

**OTHER DOCUMENTS (include author, title, name of publication, volume, pages & date of publication)**

	AR	"The Nucleus", January 2004, Vol. LXXXII, No. 5, R. Grubina; "Summer Research Report: R. Grubina on DNA Templated Synthesis for Small Molecule Library", p10-14
	AS	Nazarenko et al., "A closed tube format for amplification and detection of DNA based on energy transfer", Nucleic Acids Research, 1997, Vol. 25, No. 12, p2516-2521
	AT	Chan et al., "Intra-tRNA distance measurements for nucleocapsid protein-dependent tRNA unwinding during priming of HIV reverse transcription", PNAS Vol. 96, p459-464, January 1999.
	AU	DNA-templated synthesis as a basis for the evolution of synthetic molecules. Liu DR, Gartner ZJ, Kanan MW, Calderone CT ABSTRACTS OF PAPERS OF THE AMERICAN CHEMICAL SOCIETY 225: 612-ORGN, Part 2, MAR 2003
	AV	Rodriguez et al., "Template-directed extension of a guanosine 5'-phosphate covalently attached to an oligodeoxycytidylate template", J Mol Evol (1991) 33:477-482
	AW	Inoue et al, "Oligomerization of (Guanosine 5'-phosphor)-2-methylimidazolide on Poly(C), J. Mol. Biol. (1982), 162, 201-217
	AX	C. B. Chen et al., "Template-directed synthesis on Oligodeoxycytidylate and Polydeoxycytidylate templates" J. Mol. Biol. 1985, 181, 271
	AY	H. Rembold et al., "Single-strand regions of Poly(G) act as templates for oligo(C) synthesis" J. Mol. Evol. 1994, 38, 205.
	AZ	T. Inoue et al., "A nonenzymatic RNA polymerase model", Science 1983, 219, p859-862
	BA	O. L. Acevedo et al., "Non-enzymatic transcription of an oligonucleotide 14 residues long", J. Mol. Biol. 1987, 197, p187-193
	BB	C. Böhler et al., "Template switching between PNA and RNA oligonucleotides", Nature 1995, 376, 578-581

EXAMINER

DATE CONSIDERED

EXAMINER: Initial if reference considered. Draw line through citation if not in conformance and not considered. Include copy of this form With next communication to applicant.



<b>FORM PTO-1449 U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE</b>		<b>ATTY DOCKET NO: PEDERSEN12</b>	<b>SERIAL NO: 10/523,006</b>
<b>INFORMATION DISCLOSURE STATEMENT LIST OF DOCUMENTS CITED BY APPLICANT (Use several sheets if necessary)</b>		<b>APPLICANT: PEDERSEN, et al</b>	
		<b>IA FILING DATE: July 30, 2003</b>	<b>GROUP:</b>
<b>OTHER DOCUMENTS (include author, title, name of publication, volume, pages and date of publication)</b>			
BC	Acevedo et al., "Template-directed oligonucleotide ligation on hydroxylapatite", Nature vol. 321, 19 June 1986, p790-792		
BD	Piccirilli, "RNA seeks its maker", Nature vol. 376, 17 August 1995, p548-		
BE	A. W. Schwartz et al., "Template-directed synthesis of novel, nucleic acid-like structures", Science 1985, 228, 585-7		
BF	Halpin et al.: DNA display III. Solid-phase organic synthesis on unprotected DNA. PLoS Biol. 2004 Jul;2(7):E175. Epub 2004 Jun 22.		
BG	Halpin et al.: DNA display II. Genetic manipulation of combinatorial chemistry libraries for small-molecule evolution. PLoS Biol. 2004 Jul;2(7):E174. Epub 2004 Jun 22.		
BH	Halpin et al.: DNA display I. Sequence-encoded routing of DNA populations. PLoS Biol. 2004 Jul;2(7):E173. Epub 2004 Jun 22		
BI	"Highly Sensitive In Vitro Selections for DNA-Linked Synthetic Small Molecules with Protein Binding Affinity and Specificity" Doyon, J. B.; Snyder, T. M.; Liu, D. R. J. Am. Chem. Soc. 125, 12372-12373 (2003).		
BJ	"Translation of DNA into Synthetic N-Acyloxazolidines" Li, X.; Gartner, Z. J.; Tse, B. N.; Liu, D. R. J. Am. Chem. Soc. 126, 5090-5092 (2004).		
BK	"DNA-Templated Organic Synthesis: Nature's Strategy for Controlling Chemical Reactivity Applied to Synthetic Molecules" Li, X.; Liu, D. R. Angew. Chem. Int. Ed. 43, 4848-4870 (2004).		
BL	"DNA-Templated Organic Synthesis and Selection of a Library of Macrocycles" Gartner, Z. J.; Tse, B. N.; Grubina, R.; Doyon, J. B.; Snyder, T. M.; Liu, D. R. Science 305, 1601-1605 (2004).		
BM	"Nucleic Acid-Templated Synthesis as a Model System for Ancient Translation" Calderone, C. T. and Liu, D. R. Curr. Opin. Chem. Biol. 8, 645-653 (2004).		
BN	"DNA-Templated Functional Group Transformations Enable Sequence-Programmed Synthesis Using Small-Molecule Reagents" Sakurai, K.; Snyder, T. M.; Liu, D. R. J. Am. Chem. Soc. 127, 1660-1661 (2005).		
BO	"Translating DNA into synthetic Molecules", David R. Liu, PLoS Biology, July 2004, Vol 2, Iss. 7, p905-6.		
BP	"The Development of Amplifiable and Evolvable Unnatural Molecules", David R. Liu, Harvard Univ. Cambridge MA Dept of Chemistry and Chemical Biology, Report dated 4 Aug 2003 No. A104614, approved for public release.		
BO	Website of Prof. David R. Liu, publicly available 11 March 2000		
BR	Website of Prof. David R. Liu, publicly available 15 Oct 2000		
BS	Website of Prof. David R. Liu, publicly available 1 March 2001		
BT	Website of Prof. David R. Liu, publicly available 19 April 2001		
BU	Website of Prof. David R. Liu, publicly available 23 Sept 2001		
BV	Website of Prof. David R. Liu, publicly available 24 Sept. 2002		
BW	Website of Prof. David R. Liu, publicly available 20 Nov 2002		
BX	Website of Prof. David R. Liu, publicly available 15 Oct 2003		
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**SERIAL NO: 10/523,006**

**APPLICANT: PEDERSEN, et al**

**IA FILING DATE: July 30, 2003**

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**U.S. PATENT DOCUMENTS (include at least patentee, patent number and issue date)**

EXAMINER INITIAL		DOCUMENT NUMBER							DATE	PATENTEE	CLASS	SUB- CLASS	FILING DATE IF APPROP.
	AM	6	4	2	9	3	0	0	Aug 6, 2002	Kurz, M et al.			
	BY	6	2	0	7	4	4	6	Mar 27, 2001	Szostak, J et al.			
	BZ	6	1	4	3	5	0	3	Nov 7, 2000	Baskerville, DS et al.			
	CA	6	6	2	0	5	8	7	Sept 16, 2002	Taussig, MJ et al.			May 28, 1998
	CB	2 0	0 3	0 0	0 4	1	2	2	Jan 2, 2003	Beigelman et al.			April 4, 2001
	CC	6	5	9	3	0	8	8	Jul 15, 2003	Saito, I et al.			Aug 24, 2000
	CD	5	5	7	1	9	0	3	Nov 5, 1991	Gryaznov, SM et al.			
	CE	5	4	7	6	9	3	0	Dec 19, 1995	Letsinger, RL et al.			
	CF	5	6	8	1	9	4	3	Oct 28, 1997	Letsinger, RL et al.			
	CG	5	7	8	0	6	1	3	Jul 14, 1998	Letsinger, RL et al.			
	CH	5	7	4	1	6	4	3	Apr 21, 1998	Gryaznov, SM et al.			
	CI	5	8	3	0	6	5	8	Nov 3, 1998	Gryaznov, SM et al.			
	CJ	5	8	4	3	6	5	0	Dec 1, 1998	Segev, D			
	CK	5	5	0	3	8	0	5	Apr 2, 1993	Sugarman et al.			
	CL	5	6	3	9	6	0	3	Jun 17, 1997	Dower et al.			
	CM	5	6	6	5	9	7	5	Sep 9, 1997	Kedar et al.			
	CN	5	7	0	8	1	5	3	Jan 13, 1998	Dower et al.			
	CO	5	7	7	0	3	5	8	Jun 23, 1998	Dower et al.			
	CP	5	7	8	9	1	6	2	Aug 4, 1998	Dower et al.			
	CQ	6	0	5	6	9	2	6	May 2, 2000	Sugarman et al.			July 23, 1996
	CR	6	1	4	0	4	9	3	Oct 31, 2000	Dower et al.			Sept 11, 1998
	CS	6	1	4	3	4	9	7	Nov 2, 2000	Dower et al.			Mar 6, 1998
	CT	6	1	6	5	7	1	7	Dec 26, 2000	Dower et al.			May 13, 1998
	CU	6	1	6	5	7	7	8	Dec 26, 2000	Kedar et al.			Jul 2, 1998
	CV	6	4	1	6	9	4	9	July 9, 2002	Dower et al.			Feb 24, 1999

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**GROUP:**

	CW	5	5	7	3	9	0	5	Nov. 12, 1996	Lerner, RL et al.			
	CX	5	7	2	3	5	9	8	Mar 3, 1998	Lerner, RL et al.			
	CY	6	0	6	0	5	9	6	May 9, 2000	Lerner, R et al.			Mar 3, 1998
	CZ	4	8	2	2	7	3	1	April 18, 1989	Watson et al.			
	DA	5	8	0	4	5	6	3	8 Sept 1998	Li Ge et al.			
<b>FOREIGN PATENT DOCUMENTS (include at least document number, publication date and country)</b>													
		<b>DOCUMENT NUMBER</b>							<b>DATE</b>	<b>COUNTRY</b>	<b>CLASS</b>	<b>SUB-CLASS</b>	<b>TRANSLATION YES/NO</b>
	DB	9	3	0	3	1	7	2	18 Feb 1991	PCT			
	DC	9	8	3	1	7	0	0	23 July 1998	PCT			
	DD	0	0	3	2	8	2	3	8 June 2000	PCT			
	DE	0	0	4	7	7	7	5	17 Aug 2000	PCT			
	DF	9	0	0	5	7	8	5	31 May 1990	PCT			
	DG	0	3	2	4	6	1	6	19 July 1989	EP			
	DH	9	5	3	5	6	9	9	14 Nov 1996	PCT			
	DI	5	5	5	5	3	0	5	27 October 1994	EP			
	DJ	0	0	6	1	7	7	5	19 October 2000	PCT			
	DK	0	6	0	4	5	5	2	1 April 1993	EP			
	DL	9	5	1	2	6	0	8	11 May 1995	PCT			
	DM	0	7	7	3	2	2	7	14 May 1997	EP			
	DN	0	7	7	6	3	3	0	4 October 1996	EP			
	DO	0	6	4	3	7	7	8	14 Oct. 1993	EP			
	DP	0	0	2	3	4	5	8	27 April 2000	PCT			
	DQ	0	2	0	7	4	9	2 9	26 Sept 2002	PCT			
	DR	20	04	01	6	7	6	7	26 Feb 2004	PCT			
	DS	9	8	5	6	9	0	4	17 Dec. 1998	PCT			
	DT	0	1	0	0	8	7	6	4 Jan. 2001	PCT			
	DU	9	6	1	2	0	1	4	25 April 1996	PCT			

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PATENT AND TRADEMARK OFFICE

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IA FILING DATE: July 30, 2003

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	DV	02	1	0	3	0	0	8	27 Dec 2002	PCT			
	DW	02	1	0	2	8	2	0	27 Dec 2002	PCT			
	DX	03	0	7	8	6	2	5	25 Sept 2003	PCT			
	DY	20	04	11	0	9	6	4	23 12 2004	PCT			
	DZ	20	04	02	4	9	2	9	25 March 2004	PCT			
	EA	20	04	05	6	9	9	4	8 July 2004	PCT			
	EB	03	0	7	8	4	4	5	25 Sept. 2003	PCT			
	EC	03	0	7	8	6	2	6	25 Sept 2003	PCT			
	ED	03	0	7	8	0	5	0	25 Sept 2003	PCT			
	EE	03	0	7	8	4	4	6	25 Sept 2003	PCT			
	EF	03	0	7	8	6	2	7	25 Sept 2003	PCT			
	EG	20	04	07	4	5	0	1	2 Sept 2004	PCT			
	EH	20	04	07	4	4	2	9	2 Sept 2004	PCT			
	EI	20	04	08	3	4	2	7	30 Sept 2004	PCT			
	EJ	20	04	03	9	8	2	5	13 May 2004	PCT			
	EK	20	04	00	1	0	4	2	31.12.2003	PCT			
	EL	9	9	5	1	5	4	6	14 Oct 1999	PCT			
	EM	19	6	4	6	3	7	2	19 Jun 1997	DE			

OTHER DOCUMENTS (include author, title, name of publication, volume, pages & date of publication)

EN	Nemoto, N et al. "In vitro virus: bonding of mRNA bearing puromycin at the 3'-terminal end to the C-terminal end of its encoded protein on the ribosome in vitro". FEBS Lett. 1997 Sep 8;414(2):405-8.
EO	Roberts, RW et al. "RNA-peptide fusions for the in vitro selection of peptides and proteins". Proc Natl Acad Sci U S A. 1997 Nov 11;94(23):12297-302.
EP	Kurz, M et al. "An efficient synthetic strategy for the preparation of nucleic acid-encoded peptide and protein libraries for in vitro evolution protocols" Fourth International Electronic Conference on Synthetic Organic Chemistry (ECSOC-4), <a href="http://www.mdpi.org/ecsoc-4.htm">www.mdpi.org/ecsoc-4.htm</a> , September 1-30, 2000
EQ	Kurz, M et al. "Psoralen photo-crosslinked mRNA-puromycin conjugates: a novel template for the rapid and facile preparation of mRNA-protein fusions. Nucleic Acids Res. 2000 Sep 15;28(18):E83.
ER	Keiler et al. "Role of a peptide tagging system in degradation of proteins synthesized from damaged messenger RNA". Science. 1996 Feb 16;271(5251):990-3.
ES	Benner, SA. "Expanding the genetic lexicon: incorporating non-standard amino acids into proteins by ribosome-based synthesis". Trends Biotechnol. 1994 May;12(5):158-63
ET	Mendel, D. "Site-directed mutagenesis with an expanded genetic code". Annu. Rev. Biophys. Biomol. Struc. 1995. 24:463-93

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	<b>APPLICANT: PEDERSEN, et al</b>	
	<b>IA FILING DATE: July 30, 2003</b>	<b>GROUP:</b>

	EU	Liu DR et al. "Engineering a tRNA and aminoacyl-tRNA synthetase for the site-specific incorporation of unnatural amino acids into proteins in vivo". Proc Natl Acad Sci U S A. 1997 Sep 16;94(19):10092-7.
	EV	Liu DR et al. "Progress toward the evolution of an organism with an expanded genetic code". Proc Natl Acad Sci USA. 1999 Apr 27;96(9):4780-5
	EW	Liu, R et al. "Optimized synthesis of RNA-protein fusions for in vitro protein selection". Methods Enzymol. 2000;318:268-93.
	EX	Wang, L et al. "A new functional suppressor tRNA/aminoacyl-tRNA synthetase pair for the in vivo incorporation of unnatural amino acids into proteins" J. Am. Chem. Soc 2000, 122, 5010-5011 Pub 5 April 2000
	EY	Ellman J.A., et al. " Biosynthetic method for introducing Unnatural Amino acids site specifically into proteins". Methods Enzymol. 202, 301-336 (1992)
	EZ	José Salas et al. "Biosynthetic Polydeoxynucleotides as Direct Templates for Polypeptide Synthesis". J. of Biological Chemistry, vol.243, No. 6, 1968, p. 1012-1015

**OTHER DOCUMENTS (include author, title, name of publication, volume, pages and date of publication)**

	FA	Walder JA, Walder RY, Heller MJ, Freier SM, Letsinger RL, Klotz IM. "Complementary carrier peptide synthesis: general strategy and implications for prebiotic origin of peptide synthesis". Proc Natl Acad Sci U S A. 1979 Jan;76(1):51-5.
	FB	Bruick et al. "Template-directed ligation of peptides to oligonucleotides" Chemistry and Biology, vol. 3, No. 1, January 1996, p.49-56;
	FC	Tamura K, Schimmel P. "Oligonucleotide-directed peptide synthesis in a ribosome- and ribozyme-free system". Proc Natl Acad Sci U S A. 2001 Feb 13;98(4):1393-7.
	FD	Lewis RJ, Hanawalt PC. "Ligation of oligonucleotides by pyrimidine dimers--a missing 'link' in the origin of life?"22;298(5872):393-6.
	FE	Liu J, Taylor JS. "Template-directed photoligation of oligodeoxyribonucleotides via 4-thiothymidine". Nucleic Acids Res. 1998 Jul 1;26(13):3300-4
	FF	Fujimoto et al. "Template-directed photoreversible ligation of deoxyoligonucleotides via 5-Vinyldeoxyuridine" J. Am. Soc. 2000, 122, 5646-5647
	FG	Kenzo Fujimoto, Shigeo Matsuda, Naoki Ogawa, Masayuki Hayashi & Isao Saito "Template-directed reversible photocircularization of DNA via 5-vinyldeoxycytidine". TETRAHEDRON LETTERS 2000 , 41:33:6451-6454
	FH	Kenzo Fujimoto, Naoki Ogawa, Masayuki Hayashi, Shigeo Matsuda & Isao Saito "Template directed photochemical synthesis of branched oligodeoxynucleotides via 5-carboxyvinyldeoxyuridine". Tetrahedron letters 2000, 41:49:9437-40
	FI	Letsinger et al. "Chemical Ligation of oligonucleotides in the presence and absence of a template". J. Amer. Chem. Soc. 1993, 115, 3808-9
	FJ	Gryaznov SM, Letsinger RL. "Template controlled coupling and recombination of oligonucleotide blocks containing thiophosphoryl groups". Nucleic Acids Res. 1993 Mar 25;21(6):1403-8
	FK	Gryaznov SM, Schultz R, Chaturvedi SK, Letsinger RL. "Enhancement of selectivity in recognition of nucleic acids via chemical autoligation". Nucleic Acids Res. 1994 Jun 25;22(12):2366-9.
	FL	Herrlein MK, Letsinger RL. "Selective chemical autoligation on a double-stranded DNA template". Nucleic Acids Res. 1994 Nov 25;22(23):5076-8

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FM	Letsinger, RL; Wu, T; Elghanian, R "Chemical and photochemical ligation of oligonucleotide blocks". Nucleosides and nucleotides, 16(5&6), 643-652 (1997)
FN	Visscher J, Schwartz AW "Template-directed synthesis of acyclic oligonucleotide analogues". J Mol Evol. 1988 Dec-1989 Feb;28(1-2):3-6.
FO	Visscher J, Bakker CG, van der Woerd R, Schwartz AW "Template-directed oligomerization catalyzed by a polynucleotide analog". Science. 1989 Apr 21;244(4902):329-31.
FP	Visscher J, van der Woerd R, Bakker CG, Schwartz AW. "Oligomerization of deoxynucleoside-bisphosphate dimers: template and linkage specificity". Orig Life Evol Biosph. 1989;19(1):3-6.
FQ	Zhan, ZJ and Lynn, DG "Chemical Amplification through template-directed synthesis". J. Am. Chem. Soc. 1997, 119, 12420-1
FR	Bruick RK, Koppitz M, Joyce GF, Orgel LE. "A simple procedure for constructing 5'-amino-terminated oligodeoxynucleotides in aqueous solution Nucleic Acids Res". 1997 Mar 15;25(6):1309-10
FS	Albagli, D; Atta, RVA; Cheng, P; Huan, B and Wood, ML. "Chemical amplification (CHAMP) by a continuous, self-replicating oligonucleotide-based system" J. Am. Chem. Soc. 1999, 121, 6954-6955. Pub. on the web 14 July 1999.
FT	Xu, Y and Kool, E "Rapid and Selective selenium-mediated autoligation of DNA strands" J. Am. Chem. Soc. 2000, 122, 9040-1 Pub. on web 08/31/2000.
FU	Xu Y, Karalkar NB, Kool ET. "Nonenzymatic autoligation in direct three-color detection of RNA and DNA point mutations". Nat Biotechnol. 2001 Feb;19(2):148-52.
FV	Li X, Zhan ZY, Knipe R, Lynn DG. "DNA-catalyzed polymerization". J Am Chem Soc. 2002 Feb 6;124(5):746-7.
FW	Czlapinski, JL and Sheppard, TL. "Nucleic acid template-directed assembly of metallosalen-DNA conjugates". J Am Chem Soc. 2001 Sep 5;123(35):8618-9 published on the web 08/10/2001
FX	Leitzel JC, Lynn DG "Template-directed ligation: from DNA towards different versatile templates". Chem Rec. 2001;1(1):53-62. Published online 30 Jan 2001.
FY	Schmidt JG, Nielsen PE, Orgel LE. "Information transfer from peptide nucleic acids to RNA by template-directed syntheses". Nucleic Acids Res. 1997 Dec 1;25(23):4797-802.
FZ	DOWER, WJ et al. "In vitro selection as a powerful tool for the applied evolution of proteins and peptides". Current Opinion in Chemical Biology, 2002, 6:390-398.
GA	Brenner, S and Lerner, RA . "Encoded combinatorial chemistry" Proc. Natl. Acad. Sci. USA. Vol 89, p 5381-3, June 1992.
GB	Gartner, Z; Liu, DR "The generality of DNA-templated synthesis as a basis for evolving non-natural small molecules". J Am Chem Soc. 2001 Jul 18;123(28):6961-3.
GC	David Liu. "Expanding the reaction scope of DNA-templated synthesis Angew". Chem. Int. Ed. 2002, 41, No. 10 pp. 1796-1800. Published May 15, 2002.
GD	Gartner, ZJ et al. "Multistep small-molecule synthesis programmed by DNA templates". J. AM. CHEM. SOC. Vol. 124, No. 35, 2002, 10304-10306.
GE	Calderone, CT et al. "Directing otherwise incompatible reactions in a single solution by using DNA-templated organic synthesis". Angew Chem Int Ed, 2002, 41, No. 21. 4104-4108.
GF	Bittker, JA; Phillips, KJ and Liu, DR "Recent advances in the in vitro evolution of nucleic acids". Curr Opin Chem Biol. 2002 Jun;6(3):367-74. Review. Pub. on the web 20 <sup>th</sup> March 2002.
GG	Summerer, D and Marx, A "DNA-templated synthesis: more versatile than expected". Angew Chem Int Ed Engl. 2002 Jan 4;41(1):89-90. Review.

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	GH	Gartner, ZJ et al. "Two enabling architectures for DNA-templated organic synthesis ". Angew. Chem Int. Ed. 2003, 42, No. 12, 1370-1375.
	GI	Rosenbaum, DM et al. "Efficient and sequence-specific DNA-templated polymerization of peptide nucleic acid aldehydes". J. AM. CHEM. SOC. Vol. 125, No. 46, 2003, 13924-13925.
	GJ	Li, X et al. "Stereoselectivity in DNA-templated organic synthesis and its origins". J. AM. CHEM. SOC. Vol. 125, No. 34, 2003, 10188-10189.
	GK	Gordon, EM et al. "Applications of combinatorial technologies to drug discovery. 2. Combinatorial organic synthesis, library screening strategies, and future directions". Journal of Medicinal Chemistry, Vol. 37, No. 10, May 13, 1994.
	GL	Otto, S et al. S"Recent developments in dynamic combinatorial chemistry". Current opinion in Chemical Biology 2002, 6: 321-327.
	GM	Pavia, MR. "The Chemical generation of molecular diversity". <a href="http://www.netsci.org/Science/Combichem/feature01.html">http://www.netsci.org/Science/Combichem/feature01.html</a>
	GN	Braun, E, et al. "DNA-templated assembly and electrode attachment of a conducting silver wire". Nature, Vol. 391, 19 February 1998, 775-778.
	GO	Tanaka, K et al. "Synthesis of a novel nucleoside for alternative DNA base pairing through metal complexation" J. Org. Chem. 1999, 64, 5002-5003.
	GP	Beger, M et al. "Universal bases for hybridization, replication and chain termination", Nucleic acids research, Oxford University Press, vol. 28, no. 15, pub. 1 Aug. 2000, p2911-2914.
	GQ	Weizman, H et al. "2,2'-Bipyridine ligandoxide: a novel building block for modifying DNA with intra-duplex metal complexes". J. Am. Chem. Soc. 2001, 123, 3375-3376.
	GR	Frutos, AG et al. "Demonstration of a word design strategy for DNA computing on surfaces". Nucleic Acids Research, 1997, Vol. 25, No. 23, 4748-4757.
	GS	Loweth, CJ et al. "DNA-based assembly of gold nanocrystals". Angew. Chem. Int. Ed. 1999, 38, No. 12. 1808-1812.
	GT	Elghanian, R et al. "Selective colorimetric detection of polynucleotides based on the distance-dependent optical properties of gold nanoparticles". Science, Vol. 277, 22 August 1997,.
	GU	Storhoff, JJ and Mirkin, CA. "Programmed Materials Synthesis with DNA". Chem Rev. 1999 Jul 14;99(7):1849-1862.
	GV	Mirkin CA. "Programming the assembly of two- and three-dimensional architectures with DNA and nanoscale inorganic building blocks". Inorg Chem. 2000 May 29;39(11):2258-72.
	GW	Waybright SM, Singleton CP, Wachter K, Murphy CJ, Bunz UH. "Oligonucleotide-directed assembly of materials: defined oligomers". J Am Chem Soc. 2001 Mar 7;123(9):1828-33. Pub. on web 02/07/2001.
	GX	Bruce Smith and Markus Krummenacker "DNA-guided assembly of proteins as a pathway to an assembler" ( <a href="http://www.wadsworth.org/albcon97/abstract/krummena.htm">http://www.wadsworth.org/albcon97/abstract/krummena.htm</a> ) The 1997 Albany Conference: Biomolecular Motors and Nanomachines
	GY	DeWitt, SH et al. "Diversomers": an approach to nonpeptide, nonoligomeric chemical diversity". Proc. Natl. Acad. Sci, USA, Vol. 90, pp. 6909-6913, August 1993.
	GZ	Nielsen, J et al. "Synthetic methods for the implementation of encoded combinatorial chemistry". J. Am. Chem. Soc. 1993, 115, 9812-9813.
	HA	Ohlmeyer, MHJ et al. "Complex synthetic chemical libraries indexed with molecular tags". Proc. Natl. Acad. Sci, USA, Vol. 90, pp. 10922-10926, Dec. 1993, Chemistry.
	HB	Zuckermann, RN et al. "Discovery of nanomolar ligands for 7-transmembrane G-protein-coupled receptors from a diverse N-(substituted) glycine peptoid library". J. Med. Chem. 1994, 37, 2678-2685.

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	HC	Luo, P et al. "Analysis of the structure and stability of a backbone-modified oligonucleotide: implications for avoiding product inhibition in catalytic template-directed synthesis". J. Am. Chem. Soc. 1998, 120, 3019-3031
	HD	Luther, A et al. "Surface-promoted replication and exponential amplification of DNA analogues". Nature, Vol. 396, 19 November 1998, 245-248.
	HE	Klekota, B et al. "Selection of DNA-Binding Compounds via Multistage Molecular Evolution". Tetrahedron 55 (1999) 11687-11697.
	HF	Furlan, RLE et al. "Molecular amplification in a dynamic combinatorial library using non-covalent interactions". Chem. Commun., 2000, 1761-1762.
	HG	Ramström, O et al. "In situ generation and screening of a dynamic combinatorial carbohydrate library against concanavalin A". ChemBioChem, 2000, 1, 41-48.
	HH	Cousins, GRL et al. "Identification and Isolation of a Receptor for N-Methyl Alkylammonium Salts: Molecular Amplification in a Pseudo-peptide Dynamic Combinatorial Library". Angew. Chem. Int. Ed., 2001, 40, No. 2, 423-427.
	HI	Roberts, SI et al. "Simultaneous selection, amplification and isolation of a pseudo-peptide receptor by an immobilised N-methyl ammonium ion template". Chem. Commun., 2002, 938-939.

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